Marine Biological Laboratory
LIBRARY
JAN 2 7 1965
WOODS HOLE, MASS.

PROCEEDINGS

OF THE

CALIFORNIA ACADEMY OF SCIENCES

FOURTH SERIES

Vol. XXXI, No. 22, pp. 601–612, 6 figs. January 15, 1965

REESTABLISHMENT OF THE NORTHERN ELEPHANT SEAL *(MIROUNGA ANGUSTIROSTRIS)* OFF CENTRAL CALIFORNIA[1]

by

Keith W. Radford
Scripps Institution of Oceanography
University of California, San Diego
La Jolla, California

Robert T. Orr
California Academy of Sciences and
University of San Francisco
San Francisco, California

and

Carl L. Hubbs
Scripps Institution of Oceanography
University of California, San Diego
La Jolla, California

ABSTRACT: It is believed that the northern elephant seal may have bred as far north along the Pacific coast of North America as central California prior to the reduction of the population almost to the point of extinction by sealing activities during the nineteenth century. Since 1900, however, the species has made a remarkable comeback on Guadalupe Island, Baja California, and on the Channel Islands off southern

---

[1] Contributions from the Scripps Institution of Oceanography, University of California, San Diego, and from the California Academy of Sciences and the University of San Francisco.

California. Furthermore, northward migrants, usually identified as males, have been observed as far north as southeastern Alaska. Since 1955 elephant seals have been observed periodically on Año Nuevo Island along the central California coast. In the winter of 1960–61, females gave birth to pups and were observed copulating with one of the four adult bulls present. In May, 1961, the population reached a peak for the year of 86 individuals, all immature. During the following winter (1961–62) 23 pups were born on the island. In 1961 the species was also recorded on the Farallon Islands (about 30 miles west of San Francisco and 55 miles northwest of Año Nuevo Island).

Historical Retrospect

Whether or not the title of this paper is correct is dependent upon one's interpretation of Scammon's (1869) remark that the northern elephant seal *(Mirounga angustirostris)* "was in former years found along the coast from Cape St. Lazarus [Cabo San Lázaro, on the west coast of Baja California, México, Lat. 24° 47′ N.] to Point Reyes [central California, Lat. 38° N.]. . . ." It has generally been assumed from this and other similar statements by Scammon (1874) that elephant seals formerly may have bred as far north as central California, possibly at such locations as Pt. Reyes, the Farallon Islands, and Año Nuevo Island. Intensive sealing operations, however, brought the species close to extinction during the nineteenth century. In fact, Captain Scammon, writing about the species in 1869, stated that ". . . they have become nearly, if not quite, extinct, or have fled to some isolated, unknown points for security. The latter conjecture, however, seems hardly probable, for the Sea-elephant, it is said, has never been found in the north Pacific, except on the coasts of the Californias."

Apparently a small number survived destruction by sealers and during the past few decades the species has made a remarkable comeback. Bartholomew and Hubbs (1952 and 1960) have traced its recovery from an estimated population near the end of the nineteenth century of probably fewer than 100 individuals, confined to Guadalupe Island off the coast of Baja California, to an estimated population of 15,000 ranging from Guadalupe Island north to the Channel Islands of California. The great majority of the elephant seals recorded in 1960 were in the Guadalupe Island area, with about 1600 estimated on the San Benito and Channel islands.

The reestablishment of small rookeries on the Channel Islands of southern California, as early as 1938 on San Miguel, 1948 on Santa Barbara, and 1949 on San Nicolas, has been reported by Bonnot, Clark, and Hatton (1938), Bartholomew (1950), and Bonnot (1951). A small group was discovered on South Coronado Island, just south of the international border, in 1949 (Bartholomew, 1950). From five to as many as 73 individuals have been seen at this island locality on all of the numerous subsequent visits.

Despite some poaching, the breeding colonies on the Channel Islands have maintained themselves and are increasing (Bartholomew and Boolootian, 1960).

Northward migrations from the Baja California and southern California rookeries, chiefly by bulls, appear to have been undertaken even in years when the population was extremely low. An adult male was seen at close range inside of San Diego Bay, California, by Hubbs sometime between 1904 and 1906. Migrant individuals, usually identified as adult males, have been recorded for the coasts of southeastern Alaska (Willet, 1943; Kenyon and Scheffer, 1953), British Columbia (Cowan and Carl, 1945; Cowan and Guiguet, 1960), and Oregon (Freiburg and Dumas, 1954). John D. Isaacs of the Scripps Institution of Oceanography has informed us that when he and others fished the "blue water" far off the coast of Oregon and Washington about 1936, they occasionally saw large pinnipeds that were probably elephant seals.

In December, 1950, an adult male elephant seal was observed and photographed by several local residents at Big Lagoon, Humboldt County, in northern California. It remained in the lagoon until December 26 when the sand spit separating this body of water from the sea was opened. An account of the observations, and two photographs of the animal, were published in the *Arcata Union,* a local newspaper, on December 27, 1950.

The next northern or central California record of which we are aware is of an individual, sex unknown, that was observed among a group of sea lions hauled out at Point Reyes, Marin County. This observation was made by Cecil Tose of the California Academy of Sciences, during the summer of 1954. In February, 1955, Merton E. Hinshaw, then director of the Museum of Natural History at Pacific Grove, observed several male and female elephant seals hauled out on Seal Rock, Monterey County, California. In May of the same year he saw five or six females on the same low rocks (personal communication, 1956).

Other offshore records for the central California coast include an adult male seen by Doyle E. Gates and Clyde Paul, California State Department of Fish and Game, from the R/S *Alaska,* on May 30, 1959, ten miles north of Point Sur and about seven miles offshore. An individual of undetermined sex was seen by Nels F. Giberson about June 1, 1959, six miles west of the central Monterey Bay coast.

All these offshore records of elephant seals considerably north of known rookery areas, even in years when the population of these animals was relatively low, seem to indicate a northward migration during the non-breeding period. This northward movement of the males, to waters rich in food, may be related to their rapid growth to a large size. Similarly, it is the males of the California sea lion *(Zalophus californianus)* that migrate from northern Baja California and from southern California to the cool and rich waters north of Point Conception (Fry, 1939, and personal observations). In contrast, among the northern fur seals *(Callorhinus ursinus)* it is the females that migrate, but they move southward, leaving the bulls in the far north.

Recent Establishment on Año Nuevo Island

The first indication of the possible recent establishment of a population of elephant seals in central California was obtained when Melvin Johansen of the Snow Museum in Oakland, California, reported finding two subadult males and two females, one mature and the other younger, on Año Nuevo Island in the latter part of July, 1955. A picture, as well as an account of their presence, appeared in the *Oakland Tribune* for July 31 of that year. The following year, on September 19, 1956, Radford, in company with several other observers, noted two immature female elephant seals on the sandy beach on the east side of this island.

Año Nuevo Island, which is slightly less than 12 acres in extent, and lies approximately one-half mile off Point Año Nuevo, San Mateo County, California, at 37° 06.5′ N. Lat., 122° 20.2′ W. Long., has long been known to have the largest breeding population of Steller sea lions *(Eumetopias jubata)* south of Alaska (Orr and Poulter, 1962). It has been visited for over half a century by biologists of the California State Department of Fish and Game in the course of their sea-lion censuses, and by other observers, not one of whom, prior to 1955, is known to have reported the elephant seal from the island. Furthermore, because a lighthouse was situated there, United States Coast Guard personnel were based on the island for many years until the light was abandoned in 1948. If elephant seals had regularly visited the island during this period of occupation, their presence would almost surely have been made known.

Two of the photographs of Año Nuevo Island made on August 13, 1958, by the California Division of Beaches and Parks, which received title to the island in 1955, when examined by Orr on December 8, 1961, revealed a group of nine elephant seals on the southwest sand beach. All were immature, but one was obviously a subadult male with a well marked proboscis. William K. Kirsher subsequently informed us that he saw a small herd of elephant seals on the island in October and in December, 1960.

Beginning in the spring of 1961, regular visits have been made to Año Nuevo to observe these animals. The first of these trips was by a party from Scripps Institution of Oceanography on March 11, 1961. In May of that year a long-range project was begun by Orr, in cooperation with Thomas C. Poulter of Stanford Research Institute, to study the population dynamics and behavior of the four species of pinnipeds regularly occurring on the island, namely the northern elephant seal, the California and Steller sea lions, and the harbor seal *(Phoca vitulina)*. The results of this work, which has continued for several years, will appear elsewhere. However, certain information relative to elephant seals obtained in 1961 is included here, as well as a brief summation of data regarding the breeding of this species on the island in the winter of 1961–62. In addition, William K. Kirsher has provided data on the number of elephant seals seen by him on visits to the island in 1960 and 1961. Data on the number and approximate composition of the elephant-seal population recorded there from 1955 to 1961 (table 1) indicate an increase. The most complete data for 1961 indicate that fewer elephant seals were on the island during the summer than during the spring and autumn of that year.

The part of the island where these animals generally haul out is the sandy beach on the southwest side (fig. 1). Here they tend to be grouped on the higher part of the beach, often at the base of the bluff. As is their custom when in such situations, most of their time is spent in sleeping in various positions ranging from prone to supine. When sleeping belly side

Table 1. *Elephant Seals Observed on Año Nuevo Island, 1955–1961.*

Year	Date	Observer	Sex and Estimated Age	Total
1955	July (later part)	M. Johansen	2 subadult males; 1 adult, 1 subadult female	4
1956	Sept. 19	K. W. Radford and party	2 immature females	2
1958	Aug. 13	Div. Beaches and Parks	1 subadult male; 8 immature	9
1960	Oct. 16	W. K. Kirsher	Sex and age undetermined	35
1960	Dec. 3	W. K. Kirsher	2 subadult males included	35
1961	Mar. 11	K. W. Radford and party	4 adult males; 2 adult females; 16 immature; 2 pups	24
1961	May 7	W. K. Kirsher	All immature	86
1961	May 25	R. T. Orr and T. C. Poulter	Subadult males; females; immature	53
1961	June 27	R. T. Orr and T. C. Poulter	1 large male; mostly subadult males; possibly some females	18
1961	July 2	W. K. Kirsher	Several adult males included	24
1961	July 13	R. T. Orr and T. C. Poulter	Mostly subadult males	1
1961	July 28	R. T. Orr and T. C. Poulter	All males (4 large, 3 medium, 1 small)	8
1961	Aug. 11	R. T. Orr and T. C. Poulter	4 subadult males; 7 immature	11
1961	Sept. 7	R. T. Orr and T. C. Poulter	All immature	6
1961	Sept. 23	R. T. Orr and T. C. Poulter	All immature	50
1961	Nov. 19	T. C. Poulter	Sex and age undetermined	51

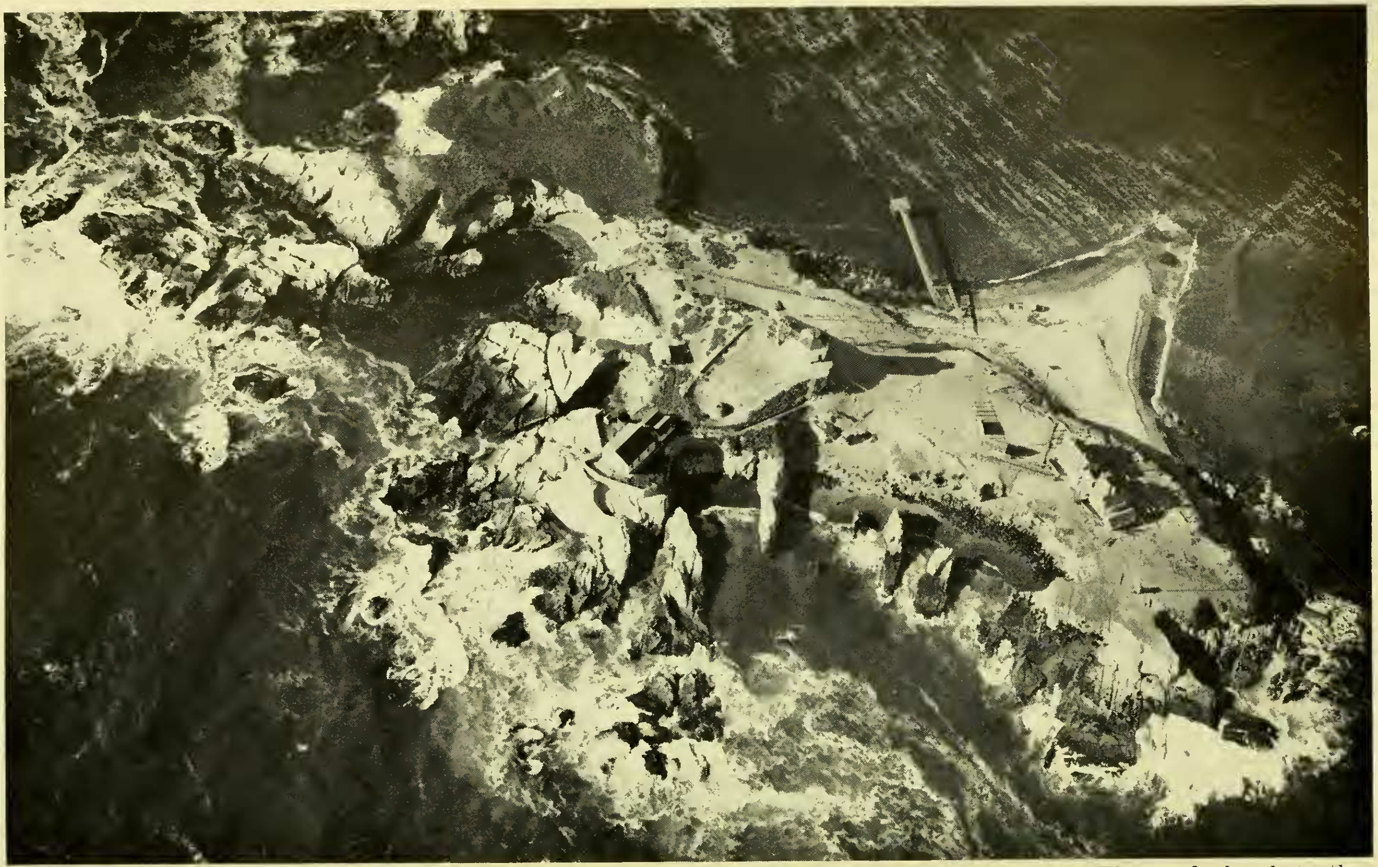


FIGURE 1. Aerial photograph of Año Nuevo Island taken on April 7, 1961, by John Gorman. The sandy beach to the left of the buildings on the right side is here seen to be occupied by both California sea lions and elephant seals. The latter are light in color and are on the higher central part of the beach as well as scattered about on the left end.

down, they frequently rouse themselves sufficiently to toss sand over their bodies with the front flippers.

As has been noted by others who have observed them on the islands off southern California and off northern Baja California, elephant seals show relatively little fear of man. Their reaction to human approach is in marked contrast to that of the California sea lions that mingle with them on the same beach. The sea lions take alarm and with much barking dash into the surf when one comes within 50 yards of them in the open. The elephant seals, on the other hand, remain on the beach, either sleeping, glancing about, or intermittently inching over the sand. Unless an observer comes quite close, they pay little attention to him. It was often possible for us to touch a sleeping individual or to mark it by spraying colored lacquer, without awakening it. Even those that are awake rarely move much until approached within about 30 feet.

The first indication that Año Nuevo Island was being used as a breeding rookery for this species was obtained by Radford and party on March 11, 1961, when 24 elephant seals were observed on the sandy beach to which reference has already been made. This population comprised four adult bulls, two adult cows, two nursing pups, and 16 immature animals.

An emaciated bull stayed at the far end of the beach, apart from the main group. Another bull, exhibiting definite dominance, vocalized and charged when any of the subordinate males approached the mature females. Even when he entered the water, the loud resonant vocalization of this dominant male appeared to deter the other males from approaching the females. He attempted copulation with each of the females on several occasions and was successful once, following the behavioral complex described by Bartholomew (1952). Later, an amber jellylike substance, similar in color to the seminal fluid described by Bartholomew, was observed on the sand in the area.

The presence of breeding animals, as well as two small nursing young in dark juvenal pelage, provided conclusive evidence that a reproducing colony was established on Año Nuevo Island in the winter of 1960–61. Of the 24 elephant seals on the beach on March 11, 1961, 16 were measured as they slept. These measurements (from tip of snout to tip of hind flipper) were as follows: two adult males, 345 and 363 cm.; two adult females, each 259 cm.; two pups in juvenal pelage, 130 and 155 cm. (the larger seen nursing); and ten slick-haired juveniles, measuring 155, 165, 173 (four), 198 (three), and 206 cm.

During the following winter 23 pups were born on the island, indicating not only a marked increase in the breeding population but also the permanence of the colony (figs. 2–6).

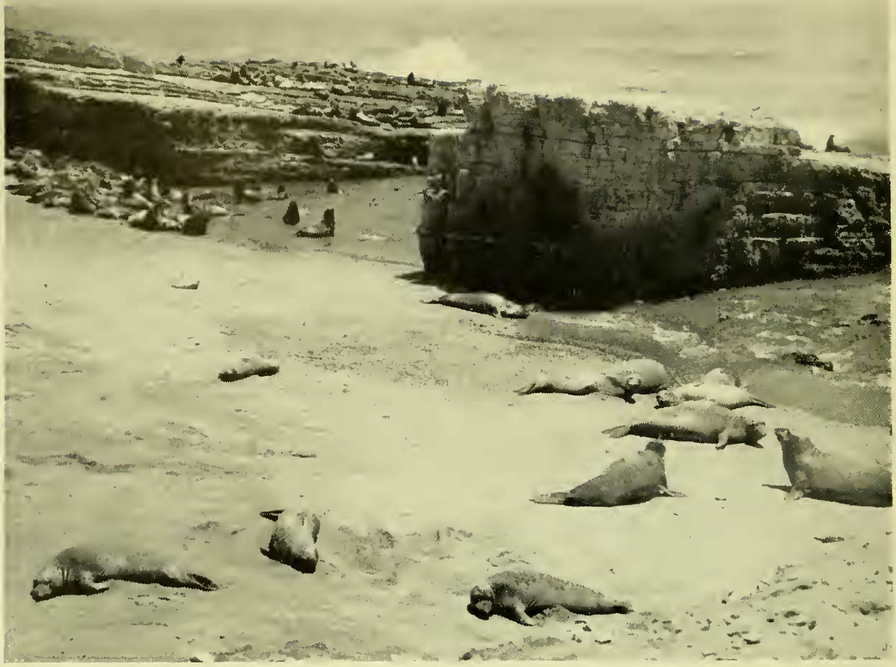
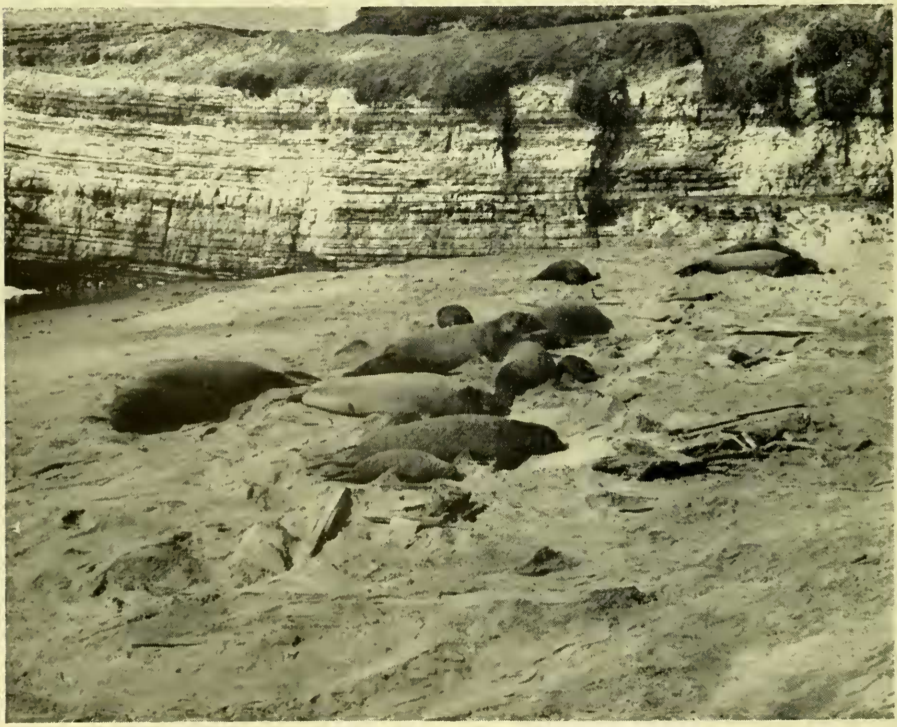


FIGURE 2. Immature elephant seals in the foreground with California sea lions beyond. Photographed at Año Nuevo Island, May 15, 1961, by Charles E. Crompton.

FIGURE 3. An adult bull elephant seal, on the left, with a harem of six cows and seven pups whose ages were estimated to range from about one to several weeks. Photographed at Año Nuevo Island, February 24, 1962, by Robert T. Orr.



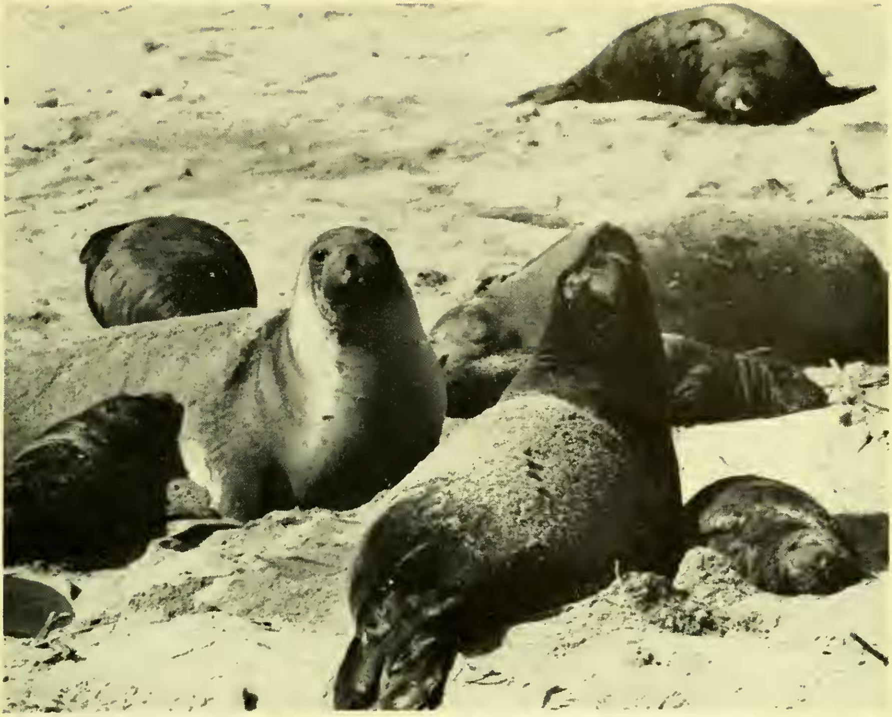
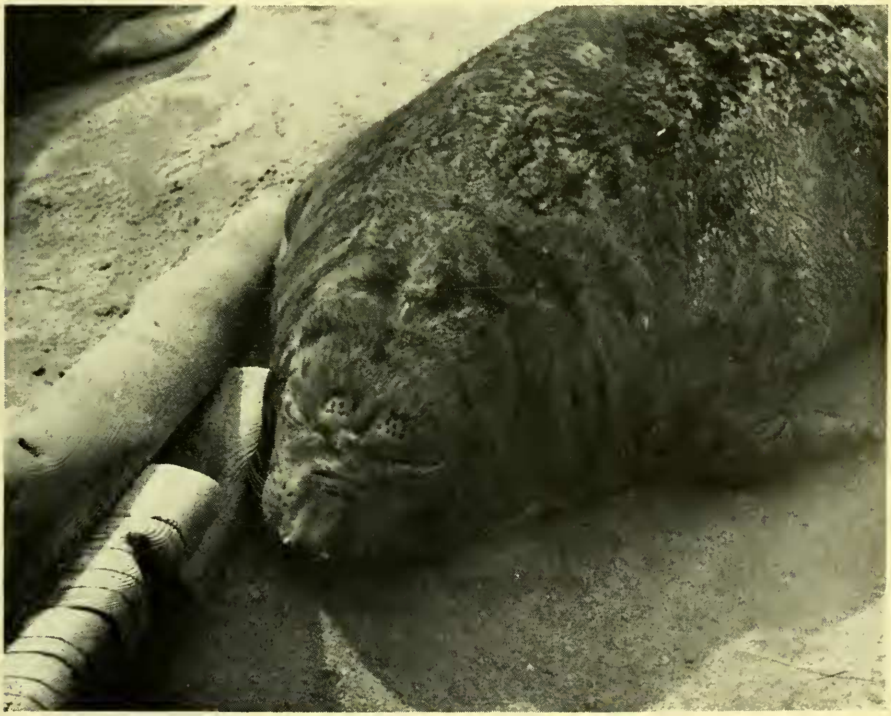


Figure 4. Elephant seal cows and pups. Photographed at Año Nuevo Island, February 24, 1962, by Robert T. Orr.

Figure 5. An elephant seal pup still in juvenal pelage. Photographed at Año Nuevo Island, February 24, 1962, by Robert T. Orr.



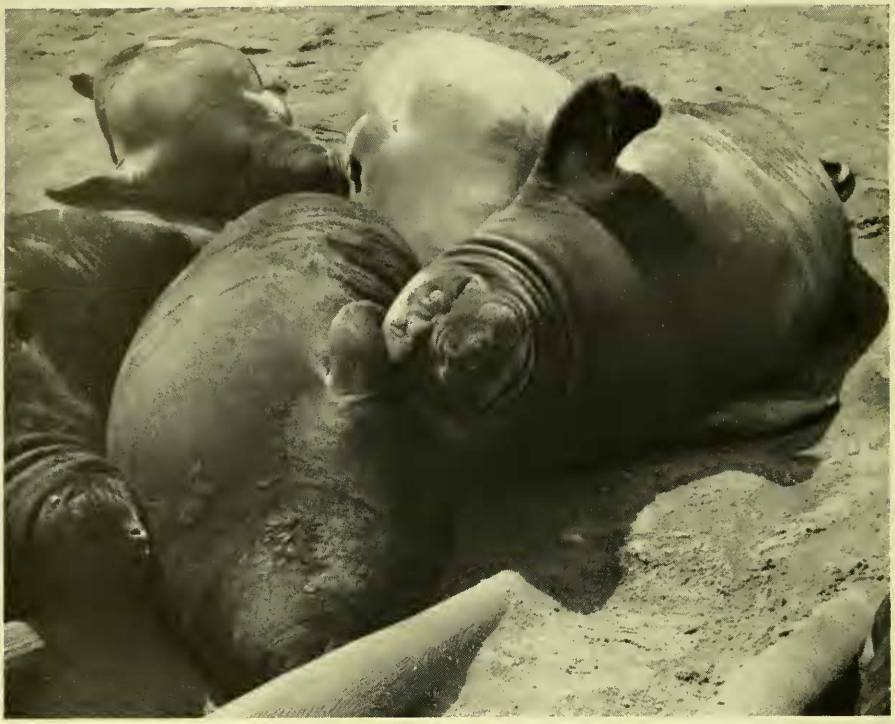


Figure 6. A group of elephant seal pups sleeping together. The largest individuals are molting or have already lost the juvenal pelage. Photographed at Año Nuevo Island, February 24, 1962, by Robert T. Orr.

Occurrence on Farallon Islands

Evidence was also obtained in 1961 that elephant seals occur presently on the Farallon Islands. David C. Regnery, Associate Professor of Biology at Stanford University, and one of his graduate students, Theodore C. Pinney, while making serological studies on European rabbits, observed two elephant seals on a sandy beach on March 29 and 30, 1961. Later an examination of a motion picture of some of the pinnipeds on the island, filmed on May 20 of that year, revealed the presence of 11 adult female or immature elephant seals. None possessed a well-developd proboscis.

Acknowledgments

For certain information contained in this report as well as for their cooperation, we wish to thank Don White and Norman Cleaver of the California Division of Beaches and Parks, William E. Ripley and John L. Baxter of the California Department of Fish and Game, Thomas C. Poulter

of Stanford Research Institute, William K. Kirsher of Menlo Park, David C. Regnery and Theodore C. Pinney of Stanford University, and John P. Harville of San Jose State College. For the aerial photograph of Año Nuevo Island, we wish to express our thanks to Jack Gorman.

LITERATURE CITED

Bartholomew, George A.

1950. A male Guadalupe fur seal on San Nicolas Island, California. Journal of Mammalogy, vol. 31, no. 2, pp. 175–180.

1952. Reproduction and social behavior of the northern elephant seal. University of California Publications in Zoology, vol. 47, no. 15, pp. 369–472.

Bartholomew, George A., and Richard A. Boolootian

1960. Numbers and population structure of the pinnipeds of the California Channel Islands. Journal of Mammalogy, vol. 41, no. 3, pp. 366–375.

Bartholomew, George A., and Carl L. Hubbs

1952. Winter population of pinnipeds about Guadalupe, San Benito, and Cedros islands, Baja California. Journal of Mammalogy, vol. 33, no. 2, pp. 160–171.

1960. Population growth and seasonal movements of the northern elephant seal, *Mirounga angustirostris*. Mammalia, vol. 24, no. 3, pp. 313–324.

Bonnot, Paul

1951. The sea lions, seals and sea otter of the California coast. California Fish and Game, vol. 37, no. 4, pp. 371–389.

Bonnot, Paul; G. H. Clark; and S. Ross Hatton

1938. California sea lion census for 1938. California Fish and Game, vol. 24, no. 4, pp. 415–419.

Cowan, Ian McTaggart, and G. Clifford Carl

1945. The northern elephant seal *(Mirounga angustirostris)* in British Columbia waters and vicinity. The Canadian Field-Naturalist, vol. 59, no. 5, pp. 170–171.

Cowan, Ian McTaggart, and Charles J. Guiguet

1960. The mammals of British Columbia. The Queen's Press, Victoria, 413 pp.

Freiburg, Richard E., and Philip C. Dumas

1954. The elephant seal *(Mirounga angustirostris)* in Oregon. Journal of Mammalogy, vol. 35, no. 1, p. 129.

Fry, Donald H., Jr.,

1939. A winter influx of sea lions from Lower California. California Fish and Game, vol. 25, no. 3, pp. 245–250.

Kenyon, Karl W., and Victor B. Scheffer

1953. The seals, sea-lions, and sea otter of the Pacific coast. Wildlife Leaflet 344, United States Fish and Wildlife Service, 28 pp.

ORR, ROBERT T., and THOMAS C. POULTER

1962. Año Nuevo Marine Biological Park. Pacific Discovery, vol. 15, no. 1, pp. 13–19.

SCAMMON, C. M.

1869. On the Cetacea of the western coast of North America. Edited by E. D. Cope. Proceedings of the Academy of Natural Sciences of Philadelphia, vol. 21, pp. 13–63.

1874. The marine mammals of the northwestern coast of North America. John H. Carmany and Company, San Francisco, 319 pp.

WILLET, GEORGE

1943. Elephant seal in southeastern Alaska. Journal of Mammalogy, vol. 24, no. 4, p. 500.